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EFFECTS OF COMPETITION AND ANXIETY UPON THE SUCCESS OF CHILDREN IN ELEMENTARY SCHOOL.

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DESCRIPTORS- *TASK PERFORMANCE, *PEER GROUPS, *ANXIETY, *STUDENT MOTIVATION, SOCIAL INFLUENCES, STUDENT ADJUSTMENT, PSYCHOMOTOR SKILLS, ASPIRATION, *ELEMENTARY SCHOOL STUDENTS, LEWISBURG, PENNSYLVANIA, TAYLOR MANIFEST ANXIETY SCALE

THE CHILDREN'S FORM OF THE TAYLOR MANIFEST ANXIETY TEST WAS USED TO DIVIDE FIFTH-GRADE MALE STUDENTS INTO HIGH AND LOW ANXIETY GROUPS IN ORDER TO COMPARE THE EFFECTS OF ANXIETY AND COMPETITION UPON PERFORMANCE. A 2-WAY ANALYSIS OF VARIANCE WAS USED (120 SUBJECTS) TO DETERMINE THE EFFECT OF THE PRESENCE OF PEERS UPON THE PERFORMANCE OF MEMBERS OF THE 2 ANXIETY LEVELS. SUBJECTS GENERALLY PERFORMED BETTER IN THE PRESENCE OF PEERS, AND ANXIETY DID NOT HAVE A SIGNIFICANT EFFECT IN LOWERING PERFORMANCE. THE AUTHORS STATE THAT THE FINDINGS ARE AT VARIANCE WITH MOST PREVIOUS RESEARCH. (JK)

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EFFECTS OF COMPETITION AND ANXIETY UPON THE SUCCESS OF CHILDREN IN ELEMENTARY SCHOOL

Cooperative Research Project No. 5-8161-2-12-1

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I. THE PROBLEM

Student motivation is one of the major problems of teachers, and teachers are perennially concerned about students whose levels of aspiration are at variance with their abilities. For the teacher, the problem of motivation is frequently a double one: How can this student be motivated to learn and How can he be induced to strive for a particular level of competency?

Some psychologists (Bugelski, 1956) have maintained that the teacher's role in motivation is essentially one of arousing mild levels of anxiety by creating an awareness in students of "not knowing". Possibly because anxiety reduction is one of the few needs readily accessible to direct manipulation, teachers have made considerable use of anxiety arousal, frequently through competitive activities, as a motivational technique. Children differ with respect to the assurance with which they face competitive activities and social pressures. What are the effects of such variables upon the goal-setting behavior and performance of children with different levels of anxiety? Do anxious children set more realistic levels of aspiration and perform better when working alone or when in the presence of their peers? Or - a more subtle question - is the mere presence of peers regarded as a threat or a signal for competition?

Research has been carried out and widely reported on the effects of success and failure and anxiety on levels of aspiration and performance, but this research has, for the most part, involved self-competition and there is reason to question its general applicability to group- or social-competition situations such as are found in the typical classroom. Those studies which have been concerned with the

effects of the presence or absence of reference groups have not considered anxiety levels as a variable. The purpose of this study was to determine whether the presence or absence of a group of peers influenced the performance and levels of aspiration of elementary school pupils and, if so, whether this influence was related to these children's levels of anxiety.

II. OBJECTIVES

The specific objectives of this study were:

(1) To determine if performance on a complex psycho-motor task differs among high and low anxious fifth-grade boys.

(2) To determine if the performance among high and low anxious subjects is affected by the presence or absence of a reference group.

(3) To determine whether levels of aspiration are affected by anxiety.

(4) To determine if the levels of aspiration of high and low anxious subjects are affected differentially by the presence or absence of a reference group.

III. RELATED RESEARCH

This study was concerned with two interrelated dependent variables, performance on a complex task and level of aspiration, and with the effects of two independent variables, anxiety and the presence or absence of a reference group, upon these dependent variables.

Research on level of aspiration has suggested three major

variables in goal-setting behavior: the effects of immediate experiences of success or failure on a particular task, the accumulated effects of previous histories of success and failure, and individual differences in reaction to success or failure. A number of studies have found anxiety to be an important variable in performance and there is a large body of research literature on the effects of reference groups or social pressure upon both performance and goal-setting. Since little, if any, research has combined all of these variables, literature related to this study has been reviewed under several headings.

A. Effects of Success and Failure on Level of Aspiration and Performance.

Level of aspiration is related to performance in two ways: the goals which an individual sets for himself have an effect upon the effort he expends and his feelings about his performance, and the individual's previous performance has a marked effect upon the goals which he sets.

Since anxiety is often related to feelings of failure or incompetency, it seemed pertinent to consider previous research on the relationship of success and failure to performance and level of aspiration even though the present study was not concerned directly with success and failure as a variable.

Level of aspiration has been defined as "the standard by which a person judges his own performance as a success or failure" (English and English, 1958), and is usually measured by asking the individual how well he expects to perform or what goal he expects to reach on the next in a series of trials involving the same task. Starbuck (1963)

stated that "A level of aspiration is a subjective goal for performance. It serves as the reference point for feelings of success or failure. To the problem solver, performance which exceeds the level of aspiration is success, and performance which falls short of the level of aspiration is failure." In defining success and failure, Gruen (1945) used failure to mean failing to achieve the goal, success as surpassing the goal, and achievement as performance equal to the goal. She then stated that "'Achievement' was usually experienced as success." Cronbach (1954) observed "If a pupil attains the expected results, he is, in one sense of the word, satisfied. If things work out so that he falls short of his expectation, he experiences some degree of failure." Hilgard (1942) indicated that there may be many interpretations for success. Usually success means reaching a goal, but sometimes success may mean coming within the range of a goal, or it may mean making distinct progress towards the goal, choosing a socially acceptable goal, or even exceeding one's goal. Success was used in this study to mean reaching or exceeding one's goal and failure as falling short of one's goal.

The effects of success and failure on level of aspiration have been reported in a number of studies. Child and Whiting (1954) indicated that "Success generally leads to a raising of the level of aspiration, and failure to a lowering." They also have reported that "The stronger the success, the greater is the probability of a rise in the level of aspiration; the stronger the failure, the greater is the probability of a lowering." Kaiser and Blake (1955) indicated that "Where levels of aspiration were surpassed by performance, the levels [of aspiration] continued to shift downward." Dryer (1954),

stated "There is a linear relationship between performance and level of aspiration." As performance improves, level of aspiration goes up; as it gets poorer, level of aspiration declines. This relationship exists for subjects who have had no chance for comparison with a group norm.

Evidence exists that success does not always cause an increase and failure a decrease in the level of aspiration. Cartwright (1942) concluded that past failure does not always lead to expectation of future failure. Cronbach (1954) noted "The effect of past failures is hard to predict." Child and Whiting have said that "Effects of failure on level of aspiration are more varied than those of success.", a statement in agreement with the findings of Sears (1940) and Gruen (1945). "Failure is more likely than success to lead to withdrawal in the form of avoidance of setting a level of aspiration." (Child and Whiting, 1954). They also commented that "Shifts in level of aspiration are in part a function of changes in the subject's confidence in his ability to attain goals."

Jucknat (1938) gave an insoluble puzzle to some children while others were allowed to succeed. She found that most of the successful children raised their goals on the next trial, confident that they would solve the next puzzle more rapidly. Children who failed rarely raised their levels of aspiration. In addition, she found that those children whose success was accompanied by feelings of triumph and pleasure were more likely to raise their levels of aspiration than were those who had succeeded but with strain and little evidence of pleasure. Children whose failures resulted in their becoming upset and frustrated were much less inclined to raise their goals than were those who were unconcerned about their failures. Although these data do not wholly

support Dryer's (1954) study, there appears to be nearly a linear relationship between performance and level of aspiration.

Sears (1940) studied the cumulative effects of a history of academic success or failure on the goal-setting behavior of fourth to sixth-graders on simple word and addition tasks. She discovered that children who had been previously successful in schoolwork set realistic goals while those with past histories of failure in arithmetic or reading tended to set their goals unrealistically low or well above any possible hope of success on these particular tasks.

Success generally leads to raising one's goal; the effects of failure, though harder to predict, usually lead to lowering one's goal. Experiences of success and failure, however, are related to the perceived difficulty of the task. Frank (1941) said "The apparent difficulty of the material is particularly important. If the task appears much too easy or much too hard, the dynamics of the situation are entirely different than if the task lies within an intermediate range of difficulty." Hilgard (1942) stated "Only a middle level of difficulty appropriate to the individual has meaning for him." Lewin, Dembo, Festinger, and Sears (1944) indicated that success is not felt if the task is too easy and failure is not felt if the task is too difficult. Therefore, it would appear that the task used in a level of aspiration task should be one on which the subject has a reasonable possibility of both success and failure.

B. The Effects of Reference Groups on Ego-Involvement in a Task.

Sears (1940) stated that "Values incorporated in the ego become reference points for self-judgments of success or failure; that is, the child cannot succeed or fail in activity which has for him no ego

value. In those activities in which he has ego-involvement, he can, and does, succeed and fail." Frank (1935), and Lewin, Dembo, Festinger, and Sears, (1944) indicate that experiences of success and failure in relation to one's goal requires ego-involvement. Therefore, it would seem important in the testing for the level of aspiration that a subject be ego-involved.

Ferguson (1962), however, gave a list of several studies that indicated that ego-involvement may improve, decrease, or have no effect on performance. She stated that "When clear-cut ego-involvement effects were obtained, the level of achievement and ego-involvement ratings were significantly higher (higher goals desired, and greater interest in doing well) for the High than the Low ego-involvement conditions." She also noted that "Ego-involvement effects failed to occur unless subjects were in the appropriate set. Only when the subjects were aware of a contrast between the ego-involvement stimuli did their responses show a clear-cut effect from the instructions." In explaining the inconsistent findings, she observed that "A lack of performance effects from ego-involving instructions may be due to the fact that ego-involvement motivation was not altered by the instructions, or it may be due to the fact that although instructions produced a change of motivation, this latter change did not lead to the predicted performance changes." She implied that ego-involvement increases the importance of success to the performer; "The valence of success is greater for High than Low ego-involvement tasks."

Ego-involvement has been viewed generally from one of two points of view: some investigators have viewed ego-involvement as a primary function of the personality of the performer; others regard the extent

of ego-involvement in a task as being largely determined by cultural forces. Cantril (1941) has implied that ego-involvement is a matter of personality, and not necessarily the result of cultural factors. Holt (1946) stated "Ego-involvement means the self-esteem is at stake." Sherif (1936), on the other hand, has written "Conformity to social usages . . . is due t. the involvement of the ego, and . . . the ego is a genetic psychological formation in which the social values are incorporated." It would appear possible that ego-involvement in a succeed-fail situation could result from either personal or social factors or from a combination of both. Sears (1940), having already indicated that "Values incorporated in the ego become reference points for self-judgments of success and failure", has remarked that "The child may find it essential to derive social approval from certain situations in which he finds himself in contact with a prestigeful person. In this case . . . also the child's ego is involved in search of self-esteem, and here also he can succeed or fail."

C. Effects of Reference Groups on Performance.

There exists evidence to support the view that performance in the absence of a reference group and in the presence of a reference group differs. In the latter situation, there is a cultural pressure to excel and to maintain a good performance (Asch, 1952). Sears (1940) has stated that "The cultural pressure to excel and to keep the performance improving, plus the cognizance of the position of the self relative to social norms, seem to account for most of the results obtained in the present investigation." Under given social conditions, an individual will do things he would not do in the absence of his reference group (Asch, 1952). Rasmussen and Zandler (1954) indicated

that the more an individual is attracted to a group, the stronger the group pressure. Kaiser and Blake (1955) noted the effect of group atmosphere on performance and also observed that ". . . it is possible to create a group atmosphere for a subject without his seeing or hearing other subjects, mediated convincingly enough by tape recording method to establish contexts of success and failure." The results of their study showed changes in the quality of performance when performance was measured on group and individual bases.

In discussing subjects in a socially competitive situation, Newcomb (1950) noted "Some people are discouraged or frightened by a competitive atmosphere, whereas others are stimulated to their best efforts." Some, however, seem to be unaffected and Newcomb has observed that ". . . differences in social environment do not automatically produce differences in behavior." An explanation for this lack of response to competitive situations may be found in Dryer's (1954) suggestion that only the middle performance subjects are competing against the group, those at the extremes remaining unaffected by the group's standard of performance. He observed that "The Middle performance groups have been shown to be the only groups actually competing against the group average presented." He also noted that ". . . more High and Low performance subjects place the performance of their friends or peer group members closer to their own level of performance." Rosenfield and Zandler (1961) concluded that "It has been found in other research that resistance to influence becomes greater as legitimacy of influence decreases." Lewin, Dembo, Festinger, and Sears (1944) say "These experiments give reason to assume the existence of a frame of refer-

ence in which the individual's performance is placed on the scale formed by the performance of his group."

It may be inferred from Sears (1940), and Frank (1935) that there can be two types of succeed-fail situations, one of self-competition and one involving social pressure. Frank (1935) states that "The individual showing self-competition indicates by his behavior that he wishes or needs to perform well in order to maintain status, and he markedly exerts himself to make a good showing." Besides self-competition, Frank indicates another influence on an individual's behavior, "awareness of social pressure."

The above evidence indicates that an individual's performance and his evaluation of it may be affected by his knowledge of the performance of a reference group. It seemed logical, therefore, to hypothesize that a subject's performance might be affected by the presence or absence of a reference group composed of his peers, even though he was unaware of their actual performance.

D. Effects of Reference Group on Level of Aspiration

Studies of level of aspiration have usually involved individual subjects participating in what might be described as self-competitive situations, since the experimenter in most studies could not be considered to represent a peer or reference group. Many classroom situations, however, involve social competition--that is, competition involving a reference group--in addition to self-competition. Research has suggested that the presence or absence of a reference group may contribute to changes in level of aspiration. Sears (1940) pointed out the importance of social influences on level of aspiration, stating, "The social forces long felt may be presumed in such cases to exert

more effect on the statement of level of aspiration than the objective datum of the single poor performance and the realistic anticipation of little improvement." Hilgard (1942) also noted that "Social factors may also distort the correlations found in the laboratory, for other experiments have shown that the group of which one is a part, the prestige of others whose scores are known, all may influence the level of aspiration as individually stated." Festinger (1942) is also of the opinion that an individual's level of aspiration is influenced by external sources.

Like Hilgard, Goswami (1958) felt that the influence of reference groups may vary with the prestige of their members. He stated that ". . . level of aspiration is inversely related to the prestige value of the reference group. If the prestige value of the reference group is increased the level of aspiration will evidently fall." Chapman and Volkman (1939) pointed out that "There does exist evidence as to the influence of a frame of reference on an individual's level of aspiration when he can compare his performance to the performance of the group." They also note, however, that "As knowledge of one's performance increases, the effect of a group's standards on level of aspiration decreases."

Dryer (1954) suggested that level of aspiration is affected by two factors: the individual's expectations and the performance of the group. He stated, "An individual's expectation of future success and failure in the performance of a task, particularly in relation to a group level of performance, is considered to be a crucial determinant of level of aspiration behavior." Hills (1955), commenting on the difficulty of measuring level of aspiration, took a similar position: "From the point of view of measurement theory,

it is a complex mixture of normative (inter-individual) and ipsative (intra-individual) measurement, and since these types of measurement are not, as a rule, interchangeable, the former being based on group standards, the latter on a standard within the individual, the goal-discrepancy measure is difficult to interpret accurately, or to develop into a more meaningful measure."

Level of aspiration, as it is usually defined, appears to be a function of both inter-individual and intra-individual variables and research suggests two possible level of aspiration situations: one of "self-competition", defined as a situation in which a reference group is absent; and a "social-competition" situation in which a reference group is present.

E. Effects of Anxiety On Performance

Anxiety has been shown to be an important variable affecting an individual's performance. In relatively simple tasks, the high anxious individuals usually perform better or the same as low anxious individuals. In relatively complex tasks, the performance of high anxious individuals is frequently inferior to that of low anxious individuals (Spence and Taylor, 1951; Hilgard, Jones and Kaplan, 1951). Castaneda, McCandless, and Palermo (1956) stated "For example, the tendency for the high anxious subjects to perform more poorly in comparison to low anxious subjects increases as the difficulty of the task increases." Farber and Spence (1953) have stated "The maze performance of the anxious subjects was significantly poorer than that of the non-anxious subjects.", in that the difficult parts of a maze, a complex task, proved to elicit the poorest behavior from the high anxious subjects. In a later study, Spence, Farber, and McFann (1956)

reported similar results. But Kauler and Trapp (1953) administered a form of the Wechsler digit-symbol test to college subjects, and found no significant differences between high and low anxious subjects. One reason for this might be that the task was of intermediate difficulty and therefore would not really qualify as either a simple or complex task.

Harleston (1962) stated that the effects of anxiety are related not only to the complexity of the task but to the sex of the subject; i.e., girls tend to have higher anxiety levels than boys, and to a situational variable; i.e., a success or failure report. Several studies (Lazarus, Deese, and Osler, 1952, and Taylor, 1958) have been made on the relationship of success and failure to performance and to anxiety. In a study done by Mandler and Sarason (1952), they have concluded that generally "An intervening report (success or failure) elicited improved performance for the low anxiety group but depressed scores for the high anxiety group." Other studies have attempted to make use of ego-involvement in place of the success-failure reports. Rosenstein (1960), as a situational variable, employed ego-involving instructions that were ". . . designed to make them 'feel tested', and it was assumed that 'feeling tested' arouses some anxiety in most individuals". His assumption was confirmed. Buskirk (1961) stated that "The performance of a high anxiety group under ego-involving instructions should show the characteristic decrements shown by all groups after an arbitrary report of failure." Child (1954) has agreed with this.

Speilberger (1962), working with college subjects, found that, when students were classified as low, intermediate, and high intelligence, the detrimental effects of high anxiety were mainly evidenced

only in the intermediate range of intelligence. High anxiety apparently was not detrimental to the performance of the high or low intelligence groups.

When dealing with anxiety and its effect on performance, Ausubel, Schiff, and Goldman (1953) found that on certain tasks, high and low anxious subjects did not differ significantly with respect to performance scores, but they did differ with respect to time in completing the problems; low anxious subjects being superior to the high anxious. Although the low anxious were significantly superior to the high anxious on the first trial, this difference was not found when the mean for the ten trials was used for comparison. The data show that both high and low anxious subjects improved with practice and that some tasks did differentiate between high and low anxious.

There appear, then, to be several factors that affect whether a given situation is anxiety-provoking: the perception of social threat, the possibility of success or failure, complexity of task, ego-involvement, novelty which in some manner constitutes a threat, intelligence level of subjects, and the sex of the subject.

F. Effects of Anxiety On Level of Aspiration

As previously quoted research has indicated, experiences with success and failure affect the individual's goal-setting behavior. The successful, confident child not only tends to set goals realistically, but often prefers to be challenged by more difficult tasks rather than settle for easy successes. However, some successful students show evidence of strain even while succeeding; they view most problems, even those within their capacity, with apprehension and

prefer safety to the possibility of success. Such variations in response to success and failure can be attributed, in part, to differences in anxiety levels. Since experiences of success or failure result from subjective evaluations, it is possible that measures of anxiety may be a more useful clue to individual goal-setting behavior than objective records of academic performance. To some students, a "B" can represent failure, while others are delighted to receive a grade of "C". Atkinson (1957) states that there is "a tendency for anxious groups to show much greater variability in level of aspiration, setting their goals either very high or very low, relative to less anxious persons".

Studies, such as that by Steckle (1957), suggest that group pressures and the possibility of social disapproval are potent sources of anxiety for many individuals and evidence exists that anxiety has an effect upon levels of aspiration. Rosenfield and Zandler (1961) stated "The present data show that students with high test anxiety set aspirations further from their present level of performance than do students with low anxiety." Cohen (1954) observed that "Both very high goal-setting and very low goal-setting are significantly related to a high degree of self-rejection." Holt (1946) stated that goal-setting is essentially a defensive reaction, that extremes in setting goals imply extreme defensive reactions.

Atkinson and Letwin (1960) found "The high test anxiety group tends to have higher average deviation scores; i.e., to show greater avoidance of intermediate risk, to leave the final exam sooner, and to have lower final exam scores than the low test anxiety group." When Kauler and Trapp (1958) analyzed their results, they found no

significant differences between the levels of aspiration set by high anxious subjects and low anxious subjects. But when they analyzed the four trials that each subject was given, they found that on the last three trials, the low anxious subjects set higher levels of aspiration than the high anxious subjects. Atkinson and Letwin (1960), however, found that high anxious subjects tend to set high levels of aspiration. One possible explanation for this difference might be that the two studies employed tasks of different levels of difficulty. In such a situation, high anxious subjects might set high levels of aspiration in a complex task and low levels of aspiration in a simple or intermediate task. This problem remains for further investigation.

Previous research suggested several possible outcomes with respect to the effects of anxiety and the presence of reference groups upon levels of aspiration and performance: (1) Some children with high levels of anxiety as a result of previous histories of failure might respond unrealistically both to self-competition and to any form of social pressure. (2) Some children with high levels of anxiety might set realistic goals and perform well in a self-competitive situation but perform less well and set unrealistic goals in situations combining self-competition and social pressures. (3) Some children with initially low levels of anxiety might show poorer performance and less realistic goal-setting because of heightened levels of anxiety due to the presence of a reference group. (4) Children with low levels of anxiety might set realistic goal and maintain consistent levels of performance under either set of conditions.

III. PROCEDURE

A. Subjects:

The subjects were 120 males selected from classrooms of Sunbury, Milton, Mifflinburg, and Shamokin, Pennsylvania. Because Frank (1941) has reported the possibility of there being sex differences in performance on level of aspiration tasks, and other studies have indicated that girls tended to have higher anxiety scores than boys (Sarason, 1960), only males were used. The procedure for selecting the subjects was as follows: The Children's Form of the Manifest Anxiety Scale was administered to 506 fifth-grade boys. One hundred twenty-six subjects were eliminated from the experiment because their lie score obtained from the CMAS was greater than four. Of the remaining 380 subjects, the top 21 per cent were designated as high anxious and the bottom 21 per cent as low anxious. Of the 160 subjects to participate in the experiment, ten were further eliminated because they were absent during the level of aspiration testing. Then 120 Ss were randomly selected from the remaining 150 Ss to be in the analysis.

B. Materials and Apparatus:

Level of aspiration and performance were measured by using a modification of the Swedish Labyrinth. This device, hereafter referred to as the Modified Labyrinth (see Appendix) consisted of a shallow wooden box, 12 by 11½ by 3 inches in depth, with a double bottom. The upper surface was in the form of a maze with low wooden barriers and holes large enough to permit a steel ball to drop through. The ball was manipulated through the maze by tilting the box. A return hole in the side of the box permitted retrieval of the ball for successive trials. Each hole was numbered consecutively up to 22

and the score was determined by the number of holes successfully passed. An illustration of the Modified Labyrinth appears in Figure I in the Appendix.

Previous experience with this device indicated that it aroused a high level of interest and persistent behavior in boys of this age level. It was, however, a very difficult task for fifth-grade pupils and, as the analysis of the data indicates, this probably affected certain outcomes of this investigation. It was felt necessary to use a difficult task in order that the subjects regard it as a serious and demanding task and not as an amusing game. Ausubel, Schiff, and Goldman (1953), for example, concluded that their failure in some cases to find significant differences in performance between high and low anxious subjects could be attributed to the fact that the task did not constitute a threat.

The questionnaire used to test for anxiety was the Children's Form of the Manifest Anxiety Scale (Casteneda, McCandless and Palermo, 1956). A copy of this scale appears in the Appendix. Questions on the scale were answered by either "Yes" or "No", and the sum of the "Yes" answers was the subject's score. There were eleven lie score items and these were scored separately from the other anxiety items.

B. Procedure:

The experimental design used in determining the effects of anxiety and peers on performance and level of aspiration is presented in Table I.

TABLE I

EXPERIMENTAL DESIGN		
	Reference Group Present	Reference Group Absent
High Anxious	30	30
Low Anxious	30	30

In order that the subjects be systematically tested, and to minimize confusion for the classroom teacher as to how subjects were to be tested, and to control for other variables, each classroom was randomly designated as reference group present or absent. The Children's Form of the Manifest Anxiety Scale instructions were read verbatim to the class with a caution that they should be as truthful as possible. Questions concerning words on the questionnaire were answered by the experimenter.

Previous research generally used the upper and lower 20 per cent to identify high and low anxious subjects on the Children's Form of the Manifest Anxiety Scale (Sarason, 1960). The high and low anxious subjects in this study were identified by taking the upper and lower 21 per cent. The scores obtained on the Children's Form of the Manifest Anxiety Scale ranged from 1 to 40. The cut-off points were 25 for the high anxious group and 13 for the low anxious group. In order to obtain the upper and lower 21 per cent, the needed number of subjects who had scores of 25 or 13 were randomly selected. To determine if the mean anxiety scores of the two low anxious groups differed significantly, two t-statistics for unequal n's were computed. Neither t-value differed significantly at the .05 level.

To obtain performance and level of aspiration measures, subjects were tested using the Modified Labyrinth in September, 1965. All children were tested by the same experimenter to keep this variable constant. Each subject was given two practice trials, to insure that he understood what was expected of him, and then ten test trials. The practice trials were not used when analyzing the data, since some subjects were not quite certain initially how to manipulate the ball through the maze. Performance was measured by taking the mean performance score of the ten test trials. The level of aspiration score was obtained by taking the sum of the expected scores and subtracting from this the sum of the performance scores for the ten test trials. This score is referred to in this study as the discrepancy score.

When testing for performance and level of aspiration in the reference group absent classrooms, the designated subjects were tested individually; i.e., no other children or adults were present except the experimenter. In the reference group present classrooms, four boys were selected to act as peers; i.e., these boys were not tested on the Modified Labyrinth, and the same four boys served as peers for each subject tested from a classroom. The same four peers were used to minimize distraction of boys coming and leaving a classroom. While the subjects were being tested, the peers were permitted to stand or sit, but were not permitted to talk or prompt the subjects. Directions for the reference group also included a caution that they should make no comment during the experiment, and that it was necessary that they should not tell the scores received by the subjects. The peers

were asked not to divulge the scores of the subjects tested because in some schools, more than one classroom was tested.

Instructions to the subjects for the level of aspiration task were:

> This is a test of concentration and skills of fifth-grade boys. It is an experiment, but if this experiment is successful, I will be able to tell you such things as who will be the best automobile driver, or the best pilot of an airplane, and such things that require concentration and skill, such as skillful hands and a quick eye. Please try to do your best. Since this is an experiment, I must ask you not to tell others the scores you will receive. It is necessary that they be kept secret. At the end of the day the experiment in this school will be completed, and at that time, if you wish, you may tell them your scores.

The Modified Labyrinth was then presented and the starting point was indicated. They were told that they were to attempt to make the ball follow the path, without falling into any holes, and that the hole in which the ball fell would be their score. The experimenter indicated that by holding the box the ball could be steered along the path.

> Before you start the ball rolling each time, it is necessary for me to ask you a question. I will ask 'What score do you expect to get this time?' You will then tell me the score you expect. You will have two practice turns and then ten test turns. Are you ready? Let's begin. 'What score do you expect to get this time?'

An attempt was made to use instructions that were ego-involving, since studies, such as that by Frank (1935), have indicated that the subjects must be ego-involved in a level of aspiration experiment. The subjects were cautioned not to tell their scores.

Jucknat (1938), as previously noted, had reported that children whose success was accompanied by feelings of triumph and pleasure were more likely to raise their levels of aspiration than were those who

showed little pleasure in their success. It was initially planned, therefore, that the experimenter would make a subjective estimate of each subject's reaction to each trial on the following scale:

Unsuccessful trials			Successful		
Frustration	Concern	Unconcern	Strain	Little Pleasure	Pleasure

However, it was found to be impossible to make a reasonable judgment of subjects' reactions to their successes and failures on the basis of their facial expressions or behavior. It was noted, however, that when asked "What score to you expect to get this time?" many subjects showed a very long reaction time, while others responded quickly. This behavior should perhaps receive further study.

IV. ANALYSIS OF THE DATA

A. Analysis of Performance Scores

Performance was considered on two bases: average performance over ten trials and the extent to which performance improved or deteriorated between first and last trials.

To determine if performance was a function of anxiety, presence or absence of peers, and/or the interaction of these two variables, a two-way analysis of variance was computed. An F ratio to test for homogeneity of variance was found to be significant ($F = 2.69$; $df = 36.30$; $p < .01$). Even though homogeneity of variances was not found, the two-way analysis of variance was used. (The use of two-way analysis of variance where variances are unequal is supported by Scheffe, 1959, and Hayes, 1963). The summary of this analysis appears in Table II.

TABLE II

SUMMARY OF TWO-WAY ANALYSIS OF VARIANCE FOR PERFORMANCE, USING MEAN SCORES*

Source of Variation	S.S.	df	M.S.	F	p
Peers	27.9367	1	27.9367	4.899	<.05
Anxiety	1.9507	1	1.9507	.342	N.S.
Interaction	4.3701	1	4.3701	.767	N.S.
Error	661.3657	116	5.7014		
Total	695.6232	119			

Critical F .05; 1,116 = 3.93

*Practice scores were not included in calculating means.

As can be seen from Table II, the effects of peers was significant at the .05 level. Table III presents the means and variances of the performance scores.

TABLE III

SAMPLE MEANS AND VARIANCES FOR Σx_i-P (PERFORMANCE)

Groups	N	$\bar{X}$	$\hat{s}^2$
Peers Present, High Anxious	30	5.647	3.4033
Peers Present, Low Anxious	30	6.283	9.1470
Peers Absent, High Anxious	30	5.063	4.6741
Peers Absent, Low Anxious	30	4.947	5.5814

The Tukey's Test of Multiple Comparison was computed and the difference between the means of Peers Present and Peers Absent was .965; this is greater than the critical value of .865. The performance of the Ss under the experimental condition of Peers Present

was significantly greater ($p < .05$) than under the experimental condition of Peers Absent, regardless of anxiety level.

B. Analysis of Improvement Scores

To determine whether Ss performance improved or deteriorated over the ten trials, a two-way analysis of variance of the improvement scores was computed. Improvement scores were obtained by subtracting each subject's score on his first trial from his score on the last trial. This analysis is presented in Table IV, and, as can be seen, no significant differences were found.

TABLE IV

SUMMARY OF TWO-WAY ANALYSIS OF VARIANCE OF IMPROVEMENT SCORES

Source of Variation	S.S.	df	M.S.	F	p
Peers Present	3.008	1	3.008	.119	N.S.
Anxiety	46.875	1	46.875	1.867	N.S.
Interaction	31.008	1	31.008	1.235	N.S.
Error	2911.034	116	25.106		
Total	2991.034	119			

C. Analysis of First-Trial Scores

It seemed possible that performance on the first test trial while the task was still relatively unfamiliar might be more strongly affected by the presence or absence of peers or by variations in anxiety levels. Therefore, a two-way analysis of variance was computed for first-trial performance scores. To test for homogeneity of variance, an F ratio was computed and found not significant. A

summary of the two-way analysis of variance appears in Table V.

TABLE V

SUMMARY OF TWO-WAY ANALYSIS OF VARIANCE OF FIRST TRIAL PERFORMANCE SCORES

Source of Variation	S.S.	df	M.S.	F	p
Peers	2.0009	1	2.0009	2.037	N.S.
Anxiety	6.6008	1	6.6008	6.726	.05
Interaction	1.1408	1	1.1408	1.1624	N.S.
Error	111.1367	116	.98135		
Total	120.8792	119			

As the data in Table V indicate, the F ratio for Anxiety was significant at the .05 level. The means and variances of all four groups appear in Table VI.

TABLE VI

MEANS AND VARIANCES OF FIRST TRIAL PERFORMANCE SCORES

Groups	N	$\bar{X}$	$\hat{S}^2$
Peers Present, High Anxious	30	4.767	9.633
Peers Present, Low Anxious	30	5.633	11.482
Peers Absent, High Anxious	30	3.333	6.782
Peers Absent, Low Anxious	30	5.433	11.357

The Tukey's Test of Multiple Comparison of Means for the first trial performance scores was computed where q .95, 4, 116 = 2.10. Significant results were obtained. The two Low Anxious groups (PP,LA and PA,LA) performed significantly better on their first

trials ($p < .05$) than the Peers Absent, High Anxious group (PA,HA). Neither group Low Anxious Ss, however, performed significantly better than the Peers Present, High Anxious Ss. When the subjects were combined into two groups, High Anxious and Low Anxious, a t-test indicated that the difference between the means for the two groups was significant at the .02 level.

D. Analysis of Level of Aspiration Scores

Each subject's level of aspiration score or discrepancy score was computed by taking the sum of the scores he anticipated making minus the sum of his actual scores for ten trials, divided by 10. To determine if level of aspiration was affected by anxiety, presence or absence of peers, and/or interaction of these two variables, a two-way analysis of variance was computed using discrepancy scores. This analysis appears in Table VII. A significant peer effect was found ($p < .05$).

TABLE VII

SUMMARY OF TWO-WAY ANALYSIS OF VARIANCE FOR LEVEL OF ASPIRATION USING DISCREPANCY SCORES

Source of Variation	S.S.	df	M.S.	F	p
Peers	36.9680	1	36.9680	5.887	.05
Anxiety	2.0330	1	2.0330	.324	N.S.
Interaction	.0004	1	.0004	.0001	N.S.
Error	728.4353	116	6.2796		
Total	767.4367	119			

Critical F .05; 1, 116 = 3.93

The means and variances of the discrepancy scores for the four groups appear in Table VIII.

TABLE VIII

MEANS AND VARIANCES OF THE MEAN DISCREPANCY SCORES FOR ALL FOUR GROUPS

Groups	N	$\bar{X}$	$\hat{S}^2$
Peers Present, High Anxious	30	.963	2.9817
Peers Present, Low Anxious	30	1.210	9.3975
Peers Absent, High Anxious	30	2.060	7.5046
Peers Absent, Low Anxious	30	2.333	5.2347

The Tukey Test of Multiple Comparison was computed for the means of the Peers Present and Peers Absent groups. The difference between the two means was 1.110 which was greater than the critical value of .910. No other significant differences were found.

The 95 per cent confidence interval was computed for each of the four variances to determine which group was most variable in setting levels of aspiration. These results appear in Table IX.

TABLE IX

CONFIDENCE INTERVALS FOR THE VARIANCES FOR EACH GROUP

Groups	
Peers Present, High Anxious	$.18912 < \sigma^2 < .53885$
Peers Present, Low Anxious	$.59605 < \sigma^2 < 1.69830$
Peers Absent, High Anxious	$.47599 < \sigma^2 < 1.35622$
Peers Absent, Low Anxious	$.33202 < \sigma^2 < .94646$

As Table VIII indicates, the Peers Present, Low Anxious group was more variable in level of aspiration setting than was the Peers

Present, High Anxious group ($p < .05$). No other significant differences were found.

Confidence intervals were computed for the variance of the combined Anxiety groups (Peers Present High Anxious and Peers Absent, High Anxious combined; Peers Present Low Anxious combined with Peers Absent, Low Anxious) and for the combined Peers Present and Peers Absent groups. In neither case were significant differences found.

V. CONCLUSIONS AND IMPLICATIONS

On the average, the children used as subjects in this study performed best when their peers were present, regardless of their levels of anxiety. Anxiety, as measured by the Children's Form of the Taylor Manifest Anxiety Scale, did not have a significant effect upon average performance over ten trials.

As Ausubel, Schiff and Goldman (1953) pointed out, "The trend in recent years has been to study the effects of situationally induced anxiety . . . anxiety experimentally generated by social threat." This procedure was followed in this study; i.e., some subjects were required to perform in the presence of a group of their peers and their performance was compared with subjects working only in the presence of the experimenter. But, judging from the subjects' performance, the presence of peers apparently was not anxiety-provoking. On the contrary, both anxious and non-anxious subjects, when confronted with a complex task, performed better in the presence of their peers. Anxiety, while having a significant effect on first-trial performance had less effect upon overall performance than did presence or absence of peers. However,

in the present study, the subjects had no knowledge of the performance of either their peers or of other subjects. The results suggest that unless a situation is definitely defined as competitive, children may not find the presence of their peers anxiety-provoking.

Although Kauler and Trapp (1958) did not find significant differences using the mean of ten trials and anxiety as the independent variable, the majority of studies have reported finding that anxiety adversely affects performance on complex tasks, although it may facilitate acquiring simple responses. The results of this study are, therefore, at variance with the findings of most previous research. One possible explanation is offered by Speilberger's (1962) study in which it was found that the detrimental effects of high anxiety on performance were mainly evidenced in the intermediate intelligence group. Since subjects in this study were randomly assigned to treatment groups, high and low anxious groups probably contained subjects of high, middle and below average intelligence. This could have resulted not in the elimination of anxiety effects but in restricting the effects of anxiety to a smaller number of individuals in the two High Anxious groups. This explanation, however, tends to be refuted by the results of the analysis of first trial scores where the High Anxious groups had a significantly poorer performance. If intelligence was a significant factor, it should also have affected first-trial performance.

On first-trial performance, anxiety did have a significant effect. When the mean first-trial performance scores of the combined Low Anxious subjects were compared with the mean performance

of all High Anxious subjects, the difference favoring the Low Anxious subjects was significant at the .02 level. When the four separate groups were compared, it was found that the two groups of Low Anxious pupils made the best first trial scores, while the poorest performance was by the Peers Absent, High Anxious group. It should be noted, however, that the two Low Anxious groups did not perform significantly better on first trials than those High Anxious subjects who performed in the presence of a group of their peers. It would appear from these data that anxiety affects performance most when the problem or the problem and its setting are unfamiliar, and when only the experimenter is present. As Ausubel, et al (1953) have pointed out, ". . . with increasing exposure to the problem--providing the panic is not too catastrophic--the individual may become sufficiently desensitized to its unfamiliarity and fear-instigating properties to recover from his disorganization and adopt a more efficacious; i.e., improving, response set."

The results of the present study suggest that the immediate threat of being confronted with an unfamiliar task affects the performance of highly anxious pupils more adversely than that of pupils with low anxiety levels. However, once familiarity with the task has reduced the novelty and threat somewhat, habitual levels of anxiety are less important in determining performance than the presence or absence of peers. Apparently, the effects of the presence of peers can swamp out the effects of the generalized sort of anxiety indicated by high scores on the CMAS. There is an additional possibility, one that has important implications for research with children: that the presence of the experimenter

adds to the anxiety-provoking nature of the task and that this anxiety may be reduced both by increased familiarity with the presence of the experimenter and by the reassuring presence of other children with whom the subject is acquainted.

Significant differences were found by Ausubel et al (1953) between anxious and non-anxious subjects on improvement socres. Such differences were not found in the present study--that is, improvement was not significantly related to presence or absence of peers or to anxiety. This is perhaps due to the fact that the task was a difficult one and ten trials were not sufficient to develop much skill. An average gain over ten trials of one or two points out of an unknown possible score probably does not indicate real improvement. The task employed by Ausubel, et al apparently permitted a larger practice effect. It is possible that significant differences might have been found had thirty or forty trials been permitted and subjects' average performance on the first five or ten trials been compared with their performance on the last five or ten trials.

Two aspects of level of aspiration or goal-setting behavior were considered: the average number of points by which each subject's predicted scores differed from his actual scores, and the variability of his discrepancy scores.

The analyses of these data did not produce clear-cut results. In the case of average discrepancy scores, once again the presence or absence of peers had a significant effect while the effects of anxiety were not significant. On the average, the combined Peers Present group was more realistic in its goal-setting than was the Peers Absent group and had smaller discrepancy scores. However,

when variability of discrepancy scores was considered, significant differences were found only between the Peers Present, Low Anxious group and the Peers Present, High Anxious group, the latter group being significantly less variable. Differences approaching significance were also found between the Peers Present, High Anxious subjects and the Peers Absent, High Anxious group, with the Peers Absent group being the more variable.

The results of this portion of the study, it will be noted, also differ from those of most previous research on the effects of anxiety on levels of aspiration (Rosenfield and Zandler, 1961; Atkinson, 1957; Sears, 1940). Most studies have found anxious subjects to be more unrealistic and more variable in their goal-setting. In the present study, High Anxious subjects tended to be somewhat more variable in predicting their performance than were Low Anxious subjects when no peer group was present but the differences were not significant and the greatest variability was found among the Low Anxious subjects when their peers were present.

These results suggest that if, as Holt (1946) has suggested, goal-setting is a defensive reaction, the defense employed by anxious pupils in this study took the form of being extremely cautious and conservative in predicting their goals, particularly in the presence of their peers. Since the task was difficult and there was a very narrow range of scores made by all subjects, conservative predictions would tend to be accurate predictions. These results may also indicate that the nature of the task may be a determining factor in goal-setting behavior. The task employed in this study was not only difficult, it was one in which chance played a relatively small part in determining scores. Consequently,

after a few trials, it was probably apparent to most subjects that one could not hope for high scores. Although there were significant differences between groups, the absolute range of discrepancy scores for all groups was relatively small.

Certain details of this study impose limitations upon any generalizations which might be derived from it. The subjects were fifth-grade boys from rural communities and small towns. The problem employed was complex in that it required a delicate and difficult eye-hand coordination. On the other hand, the nature of the problem and the goal was obvious to the subjects. In this it differed from some complex tasks where the solution or goal and the means of reaching it are not immediately apparent. The subjects were learning a new skill and did not know the scores made by their peers. In this respect, the experimental conditions differed from classroom situations in which pupils are performing on reasonably familiar material and have some knowledge of the performance of their classmates.

With these factors in mind, some aspects of this study call for additional comment. First, anxiety did not have the anticipated effect upon performance, except on first trials. This suggests, not too surprisingly, that children may be most handicapped by their anxieties when confronted with unfamiliar tasks. However, the nature of this particular task and the response of the subjects to it after the initial trials suggests that highly anxious children can function well even on complex tasks if they are strongly motivated by the task and able to "lose" themselves in it.

The results also suggest that anxious pupils may perform better and set goals more realistically in the presence of their peers than

when working alone. It has frequently been assumed that the presence of a peer group implies competition and results in heightened anxiety even when no direct comparisons of performance are made. If, as a number of studies have found, high levels of anxiety do result in poorer performance on complex tasks and unrealistic levels of aspiration, the results of this study would seem to suggest that the presence of peers may reduce the anxiety levels of anxious subjects rather than raise them, provided the presence of peers does not definitely imply competition. Unfortunately, no procedure is presently available to measure immediate fluctuations in anxiety so it can only be hypothesized that pupils, confronted with a new task, rather than being threatened by the presence of a group of their peers, may draw some support from them and may find this situation less anxiety-provoking than working with only the experimenter present. Perhaps we have concentrated too much on the anxiety-provoking potential of the group and the adverse effects of group pressures and have tended to ignore the reassuring and supportive aspects of group membership. Outside the classroom, it is apparent that most children, including many anxious and insecure ones, prefer group activities and the companionship of other children over solitary pursuits. If the presence of peers gives rise to anxieties, it is perhaps because adults, attempting to control and motivate children manipulate group relationships to produce such results.

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APPENDIX

Name_____

School_____

Grade_____

DIRECTIONS: Read each question carefully. If you think the statement is true about you, write the word YES in the space provided. If you think it is not true about you, write the word NO.

_____ 1. It is hard for me to keep my mind on anything.

_____ 2. I get nervous when someone watches me work.

_____ 3. I feel I have to be best in everything.

_____ 4. I blush easily.

_____ 5. I like everyone I know.

_____ 6. I notice my heart beats very fast sometimes.

_____ 7. At times I feel like shouting.

_____ 8. I wish I could be very far from here.

_____ 9. Others seem to do things easier than I can.

_____ 10. I would rather win than lose in a game.

_____ 11. I am usually afraid of a lot of things.

_____ 12. I feel that others do not like the way I do things.

_____ 13. I feel alone even when there are people around me.

_____ 14. I have trouble making up my mind.

_____ 15. I get nervous when things do not go the right way for me.

_____ 16. I worry most of the time.

_____ 17. I am always kind.

_____ 18. I worry about what my parents will say to me.

_____ 19. Often I have trouble getting my breath.

_____ 20. I get angry easily.

_____ 21. I always have good manners.

_____ 22. My hands feel sweaty.

_____ 23. I have to go to the toilet more than most people.

_____ 24. Other children are happier than I.

_____ 25. I worry about what other people think about me.

_____ 26. I have trouble swallowing.

_____ 27. I have worried about things that did not really make any difference later.

_____ 28. My feelings get hurt easily.

_____ 29. I worry about doing the right things.

_____ 30. I am always good.

_____ 31. I worry about what is going to happen.

_____ 32. It is hard for me to go to sleep at night.

_____ 33. I worry about how well I am doing in school.

_____ 34. I am always nice to everyone.

_____ 35. My feelings get hurt easily when I am scolded.

_____ 36. I tell the truth every single time.

_____ 37. I often get lonesome when I am with people.

_____ 38. I feel someone will tell me I do things the wrong way.

_____ 39. I am afraid of the dark.

_____ 40. It is hard for me to keep my mind on my school work.

_____ 41. I never get angry.

_____ 42. Often I feel sick in my stomach.

_____ 43. I worry when I go to bed at night.

_____ 44. I often do things I wish I had never done.

_____ 45. I get headaches.

_____ 46. I often worry about what could happen to my parents.

_____ 47. I never say things I shouldn't.

_____ 48. I get tired easily.

_____ 49. It is good to get high grades in school.

_____ 50. I have bad dreams.

_____ 51. I am nervous.

_____ 52. I never lie.

_____ 53. I often worry about something bad happening to me.

Scoring Sheet for Performance and Level of Aspiration on Modified Labyrinth

Date_____ Name_____

School_____ Teacher_____

TRIALS

	Exp.	Actual	Disc.
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
13.			

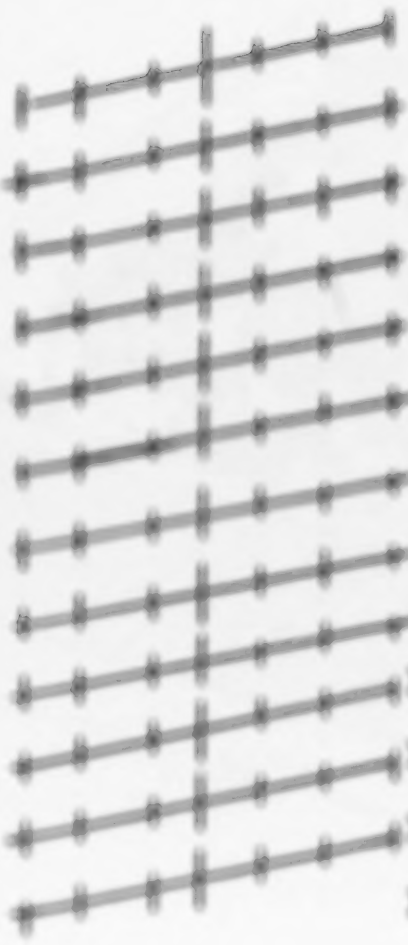

Figure 1